

Interabdominal analgesia in pain management after cholecystectomy: A preliminary report

HIROSHI IWAMA¹, TAKASHI SUZUKI¹, SHIGERU HIRATA¹, KANEYUKI KAWAMAE², YOICHI AKAMA³, CHOICHIRO TASE³, and AKIRA OKUAKI³

Departments of ¹ Surgery, and ² Anesthesiology, Central Aizu General Hospital, Aizuwakamatsu, 965 Japan

³ Department of Anesthesiology, Fukushima Medical College, Fukushima, 960-12 Japan

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Introduction

In recent years, recognition of the importance of adequate postoperative pain relief has been increasing [1–3]. We usually perform epidural anesthesia for upper abdominal surgery. However, it is occasionally either impossible or too risky to place a catheter into the epidural space because of hemorrhagic diathesis, adhesion, or synostosis. Thus, we have developed a new technique as the sole treatment for postoperative pain in cholecystectomy patients which involves the insertion of an epidural catheter into the omental sac and the administration of local anesthetics. The results so far have been encouraging, and we feel that the method is worthy of description. We have termed this technique interabdominal analgesia (IAA).

Patients and methods

Eight patients from cholecystectomy with a transrectal approach were studied. Their ages ranged from 42 to 76 years and ASA grades were from 1 to 2. Four of the patients were men and four were women.

All of them were premedicated with atropine sulfate 0.01 mg/kg and butorphanol tartrate 1 mg i.m. 1 h before entering the operating room. In the operating room, we placed an epidural catheter into the epidural space from the lower thoracic vertebrae, followed by induction of general anesthesia with isoflurane. After

removing the gall bladder and during closure of the peritoneum, an 18-gauge epidural catheter was inserted 5–10 cm into the omental sac through the epiploic foramen. The other edge of the catheter was drawn out of the body through the Tuohy needle which was inserted at the lateral side of the skin incision (Fig. 1). At the completion of surgery, 1% mepivacaine 10 ml was administered into the epidural space followed by waking the patients, extubating and terminating general anesthesia, and subsequently entering the recovery room.

Ninety minutes after the completion of surgery, 2% lidocaine 10 ml was administered into the omental sac through the IAA catheter. We measured blood pressure, pulse rate, respiratory rate, and arterial blood gas before and after administering lidocaine, and changes in the visual analogue scale (VAS, 0–10) were evaluated by nurses. Statistical analysis was calculated by the Wilcoxon test. Our institutional committee approved this study, and informed consent was obtained from patients.

Results

Mean blood pressures, pulse rates and respiratory rates were stable during 60 min after IAA (Fig. 2). $Paco_2$ was not changed, and Pao_2/F_iO_2 increased slightly; however, the differences were not significant (Fig. 3).

All patients who were still drowsy from the isoflurane or who were under the effects of epidural block, indicated 0 on the VAS at the completion of anesthesia. It took about 15 min from the completion of surgery to the termination of the general anesthesia. At 90 min after the completion of surgery and before IAA, all patients were clear conscious and indicated 6.63 on the VAS. VAS decreased and reached a mean minimum value of 2.75 45 min after IAA, and gradually increased thereafter. Two patients required supplemental analgesia

Address correspondence to: H. Iwama

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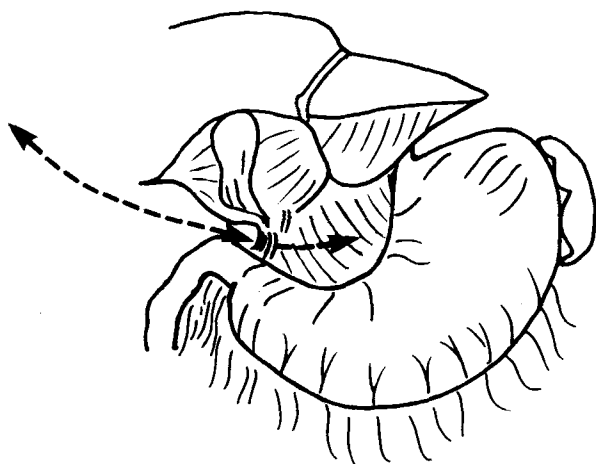


Fig. 1. Schema showing catheter location of intraabdominal analgesia (IAA)

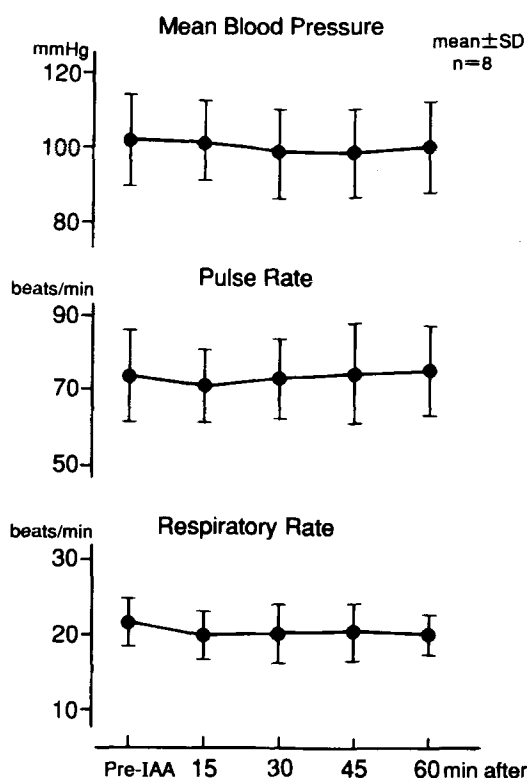


Fig. 2. Changes in blood pressure, pulse rate, and respiratory rate

120 min after completion so observation beyond this time was not possible (Fig. 4). We evaluated the analgesic effects of each patient, and an excellent effect was noted in three patients, good effects in three, and almost no effect in two, resulting in an efficacy rate of 75% for IAA.

No hypesthesia or hypalgesia was noted in the skin, and pressure on incised wound increased the level of pain. These findings were characteristic of IAA.

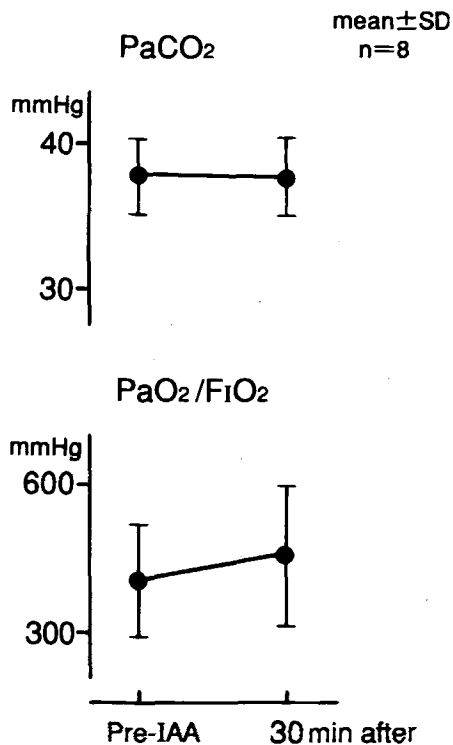


Fig. 3. Changes of arterial blood gas

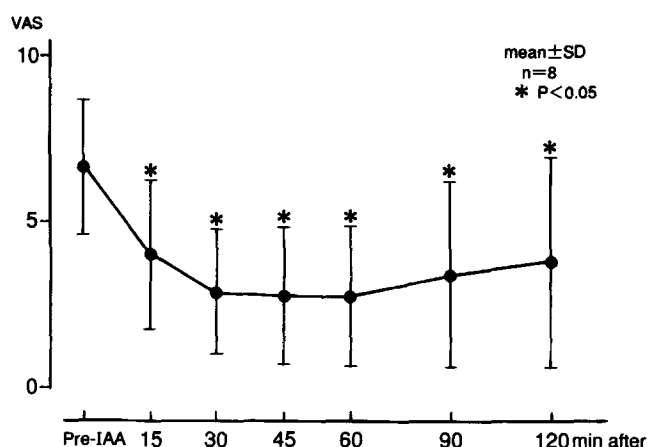


Fig. 4. Changes of visual analog scale score

Discussion

There are several methods for pain relief, which include narcotics, nonnarcotic analgesics, interpleural regional analgesia (IPA), and epidural anesthesia in upper abdominal surgery. However, narcotics often do not provide adequate pain relief, and there is the risk of depression of both respiration and the cough reflex [4]. IPA occasionally causes pneumothorax [5], so it is indi-

cated only for chest trauma or postthoracotomy patients in some reports [6,7]. Although epidural anesthesia may offer encouraging results for upper abdominal surgery, the number of unsuccessful cases reported have been increasing due to certain risk factors and because the number of surgical procedures patients performed in elderly have been increasing in recent years. For these reasons, it is necessary to develop new techniques for pain relief.

In the present study, we demonstrated a relatively reliable method of pain relief in postcholecystectomy patients, as only two patients of eight indicated almost no effect. In addition, IAA did not affect the circulation or the respiration. The pancreas is located between the omental sac and the celiac plexus. Therefore, we speculate that lidocaine, which is administered into the omental sac, would permeate around the celiac plexus through the retroperitoneum and the pancreas, and block the celiac plexus indirectly. So the main action of this method for pain relief is considered removal of the visceralgia. Celiac plexus block is classified into transcrural celiac plexus block and retrocrural splanchnic nerve block [8]. Although blood pressure decreases significantly in retrocrural splanchnic nerve block, transcrural celiac plexus block, which seems to be similar in action to IAA, is reported not to show hypotension [9] and IAA showed no changes of blood pressure in the present study.

Little has been written about the administration of local anesthetics into the abdominal cavity for pain relief, as with IAA. Hanson and Hingson [10] reported seven patients who underwent painless laparotomy with 500–1200 mg of intraperitoneal lidocaine. They found the average duration of anesthesia to be 45 min. McDonough and Bulaong [11] reported the successful use of continuous infusions of lidocaine into the cul-de-sac for control of postoperative pain after vaginal hysterectomy. Cruikshank et al. [12] administered 0.5% lidocaine 80 ml into the abdominal cavity for postpartum sterilization, and obtained good analgesic effects and shortened the hospitalization. According to the chapter "Intraabdominal Anesthesia by Peritoneal Lavage" in "Regional Block" by Moore [13], operating analgesia is established in 3–8 min and lasts 30–60 min by administering 0.5% lidocaine 200 ml intraperitoneally, and systemic toxic reactions do not occur. The intestine shrinks until it is the size of a large grapefruit,

and the peritoneum may be picked up and pulled together without difficulty.

In our opinion, IAA has some advantages. The procedure is technically simple and can be performed by surgeons. The epiploic foramen is often chosen for drainage sites in upper abdominal surgery, so we consider that an epidural catheter in this site will be safe. We removed the IAA catheters within 3 days in the present study. Complications such as a infection, however, did not occur.

In conclusion, IAA seems to be an effective method for pain relief in postcholecystectomy patients. It is technically simple and safe, does not affect the circulation or the respiration, and probably removes the visceralgia. This new technique is indicated for patients who fail to undergo or have no indications of epidural anesthesia.

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